

CLAIMS

1. A Group III nitride semiconductor element comprising a substrate; a first nitride semiconductor layer composed of AlN which is provided on the substrate; 5 a second nitride semiconductor layer composed of  $Al_{x_1}Ga_{1-x_1}N$  ( $0 \leq x_1 \leq 0.1$ ) which is provided on the first nitride semiconductor layer; and a third nitride semiconductor layer composed of  $Al_{x_2}Ga_{1-x_2}N$  ( $0 < x_2 < 1$  and  $x_1 + 0.02 \leq x_2$ ) which is provided on the second nitride semiconductor 10 layer.

2. A Group III nitride semiconductor element according to claim 1, wherein said substrate is selected from a group consisting of sapphire single crystal, Si single crystal, SiC single crystal, AlN single crystal, 15 and GaN single crystal

3. A Group III nitride semiconductor element according to claim 1 or 2, wherein said second nitride semiconductor layer is formed of an island-like structure in which crystals of different heights are arranged so as 20 to be separated from one another.

4. A Group III nitride semiconductor element according to any one of claims 1 to 3, wherein said second nitride semiconductor layer contains a region having a low Al content and a region having a high Al 25 content.

5. A Group III nitride semiconductor element according to any one of claims 1 to 4, wherein said second nitride semiconductor layer is composed of  $Al_{x_1}Ga_{1-x_1}N$  ( $0 \leq x_1 \leq 0.05$ ).

30 6. A Group III nitride semiconductor element according to claim 5, wherein said second nitride semiconductor layer is composed of  $Al_{x_1}Ga_{1-x_1}N$  ( $0 \leq x_1 \leq 0.02$ ).

35 7. A Group III nitride semiconductor element according to any one of claims 1 to 6, wherein said second nitride semiconductor layer has a thickness of 1

to 500 nm.

8. A Group III nitride semiconductor element according to claim 7, wherein said second nitride semiconductor layer has a thickness of 1 to 400 nm.

5 9. A Group III nitride semiconductor element according to claim 8, wherein said second nitride semiconductor layer has a thickness of 1 to 300 nm.

10 10. A Group III nitride semiconductor element according to any one of claims 1 to 9, wherein said second nitride semiconductor layer is composed of an undoped semiconductor.

15 11. A Group III nitride semiconductor light-emitting device comprising a Group III nitride semiconductor element according to any one of claims 1 to 10; a fourth nitride semiconductor layer provided on said third nitride semiconductor layer of said semiconductor element, said fourth nitride semiconductor layer including an n-type layer, a light-emitting layer, and a p-type layer, which are successively formed atop said third nitride semiconductor layer in this order; a negative electrode provided on said n-type layer; and a positive electrode provided on said p-type layer.

20 12. A light-emitting diode comprising a Group III nitride semiconductor light-emitting device according to claim 11.

25 13. A laser diode comprising a Group III nitride semiconductor light-emitting device according to claim 11.

30 14. A semiconductor device comprising a Group III nitride semiconductor element according to any one of claims 1 to 10.